

Dr. Christiane Schmidt

**TNK051: Planning of Air Traffic**  
**Homework Set 3, 2019**

Solutions are due October 14, 2019, 13:00. **Please put your name on all pages!**

**Question 1 (Longest Path in a DAG):**

Use the algorithm from the lecture to compute the longest path in the DAG from Figure 1.

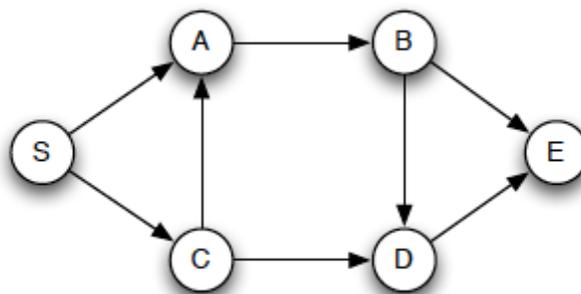


Figure 1: DAG

**Question 2 (Aircraft Routing):**

We revisit the airline from homework set 1. The timetable is still given by Figure 2.

- (a) Now, the airline only has a single Jetstream with 30 minutes turn-around time. Moreover, we only consider a single day of operation. The airline wishes to maximize the number of flights it can cover with the single aircraft. Use the appropriate method from the lecture to solve this problem. Which flights should the aircraft serve? How many are these?

**Question 3 (Safety Management Systems):**

Nordic Flights is a new small Swedish airline that will offer domestic flights.

Flightnr	Dep time	Arr time	Dep AP	Arr AP	E[Pax]	R
1	450	900	A	L	16	500
2	1000	1230	A	G	18	300
3	1020	1410	A	L	25	500
4	1810	2200	A	L	49	500
5	510	840	L	G	12	400
6	1030	1225	L	U	21	350
7	1510	1810	L	G	55	400
8	2020	2350	L	A	24	400
9	615	800	U	A	21	200
10	1545	1740	U	A	23	200
11	1745	1930	U	L	19	250
12	2000	2310	U	G	17	500
13	430	710	G	A	12	400
14	920	1250	G	U	24	500
15	1330	1640	G	U	53	500
16	1920	2250	G	U	11	500

Figure 2: Timetable

Before they are allowed to start they have to establish a safety management system. Explain what such a safety management system encompasses and present the airline a draft of a safety management system that they could implement directly. Do not forget that they do not know anything about Safety Management Systems, hence, make sure you give them a step by step guide.

**Question 4 (Maximize Yield):**10 You get hired by a new airline, AirSweden, to make sure that they operate with a profit. The owner of AirSweden, Mrs. A, has heard representatives of other airlines talking about yield, and now suggests to maximize the yield. Explain to Mrs. A what yield is, and detail why it is not a good idea to solely aim for maximizing the yield.

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Question 1, 3, and 4 should be submitted individually, question 2 should be handled in groups and a short report should be submitted for both. The report should be both sent by email to [christiane.schmidt@liu.se](mailto:christiane.schmidt@liu.se) and uploaded to lisam no later than the due date.